Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME 5.] NEW YORK JANUARY 19, 1850. [NUMBER 18.

THE
Scientific American,
THE
BEST MECHANICAL PAPER IN THE WORLD.
CIRCULATION 14,000.
PUBLISHED WEEKLY.
At 128 Fulton Street, New York, (Sun Building,) and 13 Court Street, Boston, Mass.
BY MUNN & COMPANY.
The Principal Office being at New York.
Barlow & Payne, Agents, 89 Chancery Lane, London

TERMS--$2 a year--$1 in advance, and the remainder in 6 months.

Rail Road News.

Effect of the N. Y. and Erie R. R. on the Butter and Poultry Markets.

Fifty thousand dollars' worth of butter has been shipped on one boat from Newburg, at one time; while twenty to thirty thousand dollars' as a common freight, used to be frequent before the New York and Erie railroad was completed. The road somewhat lessened the freighting business of Newburg, and added immense amounts to the New York market of almost everything that is eatable. A few years ago, turkeys, ducks, and chickens were hawked about the streets of Oswego, begging for buyers. But now they are carried to this city, and we have to pay pretty well for them with all our railroad conveniences. Our farmers on the line of railroad, are perhaps more benefitted by them than any other class.

Charcoal Roads.

Suppose your road is thirty feet wide; the timber on the space which your road occupies is all cut, and the trees all laid lengthways upon a space say ten feet wide. The pile of trees and bush extending the distance required, is then covered with turf and a fire set at each end, and it will burn and settle as handsomely and even as can be, and is just hard enough so as not to hurt the horses' feet. The rain that falls upon the road will run off without soaking into it.

Obstructions on Railways.

A correspondent from Georgia, writing us about those scoundrels who put obstructions or railways, causing fearful accidents sometimes; says that it would be a good plan to keep a well trained dog in every train of cars to scent out the guilty persons. He says that "the very idea of dogs being kept for such a purpose would terrify those whose hearts would prompt them to such acts, for fear of detection."

Railroads.

A reduction of fare has taken place on the Harrisburg and Philadelphia Railroad. The ratio is now 3 cents per mile.

The opening of the Newburg Railroad was celebrated on the 9th inst., and among the eatables was a whole ox, hogs, sheep and what not. A great number got *fat* on the occasion, at the expense of the stockholders, but what of that.

The Madison and Indianapolis Railroad has declared a semi-annual dividend of four and a half per cent.

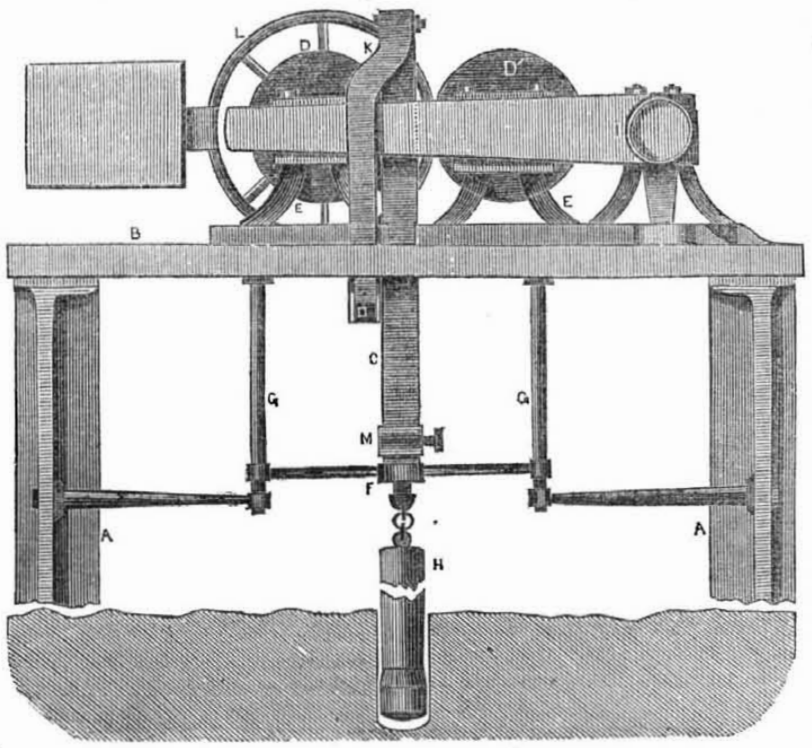
$150,000 of the stock of the Hudson River Railroad was sold in our city last week.

The Harlem Railroad has reduced its commuting fares to Morisiana and Harlem to $15 for the first 6 months, and $10 for the second.

Nova Scotia Wood.

Seven years ago a single cargo of 20 cords of wood was brought from Nova Scotia to Newburyport, (Mass.) and sold. Since then the trade has steadily increased, and during the year past it amounted to 4000 cords, valued at about $20,000.

MACHINERY FOR BORING AND SINKING ARTESIAN WELLS, &c.---Figure 1.



This is an invention of W. G. Gard, of Cornwall, Eng., patented in that country and first described by Barlow & Payne, in the Patent Journal. The principal object of the invention is for deep boring. Fig. 1 is a side elevation of the machinery for operating the boring tool. A A are two standards; B is an entablature; C C is a parallel sliding bar passing freely through B, and between two broad pulleys D D1, fitted on small standards, E E. The one which carries the pulley D is fixed, the other which carries D 1, is fitted to advance and recede from the sliding bar, C, to grip and release the same alternately. The lower end of the sliding bar, C, is furnished with a cross bar, F, having an eye at either end, fitted at the vertical rods, G G. These rods form guides for the sliding bar, C, to keep it in its position. H is the boring bit, attached to the bar, C, by means of a rope, or it may

Fig. 2.

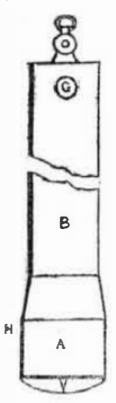
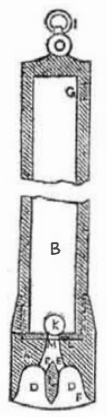


Fig. 3.



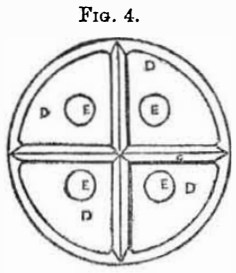
be a series of jointed metal rods. I is a strong lever, which works on a fulcrum at one end, the other supporting a heavy weight, which, along with a springcatch, K, impels the moveable pully, D 1, towards the fixed one, exerting pressure on the sliding bar, C. L is a drum whereby motion from any power, crank or band, is communicated to the pulley, D. M is a cam, fitted to the sliding bar, C, and can be adjusted by a screw, which has the effect of regulating the height to which the boring bit is elevated for each stroke. This cam, as it rises with the weighted lever, I, relieves the sliding bar, C, from the pressure of the friction pulleys, and it then falls. The weighted lever is sustained by the spring catch after being raised, allowing time for the fall of the boring tool; but simultaneously therewith, the supporting catch is struck from under the weighted lever by a cam fixed on the upper end of the sliding bar, when it again produces a repetition of the stroke. The upper cam also serves as a stop to the sliding bar, keeping it from descending too far.

This way of operating the tool does not present so much novelty worthy of consideration as the tools themselves, but from it some good ideas can be gathered.

Fig. 2; is a side view of the hollow shaft. Fig. 3 is a vertical section of it, and fig. 4 is a plan view of the tool as combined and constructed. The same letters refer to like parts.

The borers hitherto employed for this purpose have been liable to objections, as they are sometimes made like the nose bits used in carpentry, and have to be raised up as often as the hollow fluted parts are filled up. At other times they are made of a chisel form, with a hollow handle, and which also is apt to get encumbered with the outbored material. The form of the boring tool, in this invention, consists in making the cutting ends or bits of an inverted cap-like form divided by a cross into

Fig. 4.



four segments with apertures leading from them into a hollow shaft, screwed into a neck of the bit, whereby the outbored materials are at once removed from the cutting edges. A is the part which forms the cutter and is screwed to the hollow shaft. The cutting face, A, is of a hollow form, divided by a cross, C, into four sections, D D D D, each separated hollow terminating in a hole, E, above, leading to a main opening. The cutter is enlarged to the line, H, then it tapers to where it joins the hollow shaft, to allow it always to pass freely after the cutter. The cutting edge is bevelled only on the inside, to project the parts of the rock cut, inwards and upwards, leaving the outside free from obstruction in working. The pieces of rock detached by the cross cutting edges are also projected upwards, and conveyed by the concave channels, E, to the main channel, M. L is a valve seat secured in its place by screwing down the shaft, B, on its surface, and it has an opening in its centre corresponding with the channel, M, on which is fitted a ball valve, K. There is a pin (not seen) extending across the inside of the hollow shaft, to prevent the ball, K, from rising too high.—When the bored matter, therefore, is forced into the hollow shaft, lifting the ball valve, it immediately closes to prevent it from returning. In this way the boring can be continued until the entire capacity of the hollow shaft is filled, when it is to be withdrawn from the boring and the contents removed, which may be effected by turning the bit upside down, when they will pass out of the aperture, G. I is a link to unite the hollow tool shaft with a rope to the bar C, fig. 1, and the rope may have its upper end out of the mouth of the bore, to raise up the hollow shaft and boring tool for any purpose.

Useful Receipts.

On the Manufacture of the Celebrated Damascus Blades.

Nicolo Milonas, for some time consul in the East, in endeavouring to discover the processes employed by the Kourdes in the manufacture of their sword blades, observed:—1. That the manufactories in which these blades were made were situated at the decivility of the mountains, near cascades, the water of which, falling from rock to rock, arrived in the most limpid state in the reservoirs constructed for its reception, in which reservoirs the blades are tempered. These reservoirs are themselves placed in situations where the air is very pure. These conditions of purity of air and water are considered necessary for the success of the operation.

2.—Iron of the purest quality is selected.—Submitted to a very high temperature, the first tempering is commenced when the iron is at a white heat; the metal is exposed before fusion, the fuel employed being placed on each side of it; the red hot iron is then covered as quickly as possible with fatty and oily matters paste made from bones, wax, &c. This operation tends, according to the manufacturers, to render the blade flexible. The second tempering is performed by the same process, with this difference, that the heated iron, after having thrown off considerable quantities of sparks and having been exposed, is covered with a paste composed of powdered bones, and purified mutton suet. The third tempering is effected, by disposing the metal in such a manner, that it may be seized by a man on horseback, who rides at full gallop in order that the blade which he keeps in an elevated position may receive the impression of the air.

3.—The fuel employed is anthracite and turf. In order to obtain favourable results, it is necessary to use fuel entirely free from sulphur, and combine, as much as possible, the heating of animal, vegetable, and mineral substances.

Languages.

There are three thousand six hundred and sixty-four known languages now in use in the world. Of these, nine hundred and thirty seven are Asiatic, five hundred and eighty-seven European; two hundred and seventy-six African: and one thousand six hundred and twenty-four American dialect.

The Cherokee arrived in this city on last Sunday from Chagres, with $650,000.

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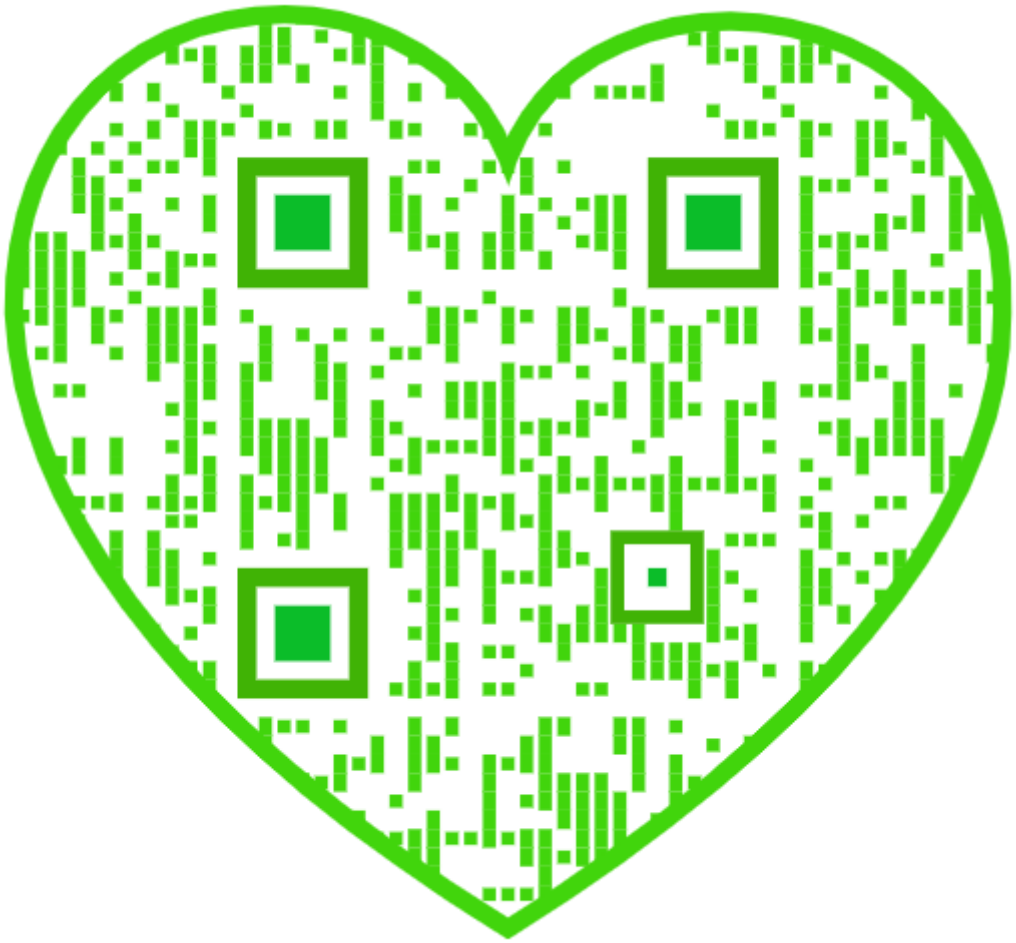

Miscellaneous.

Correspondence of the Scientific American.

WASHINGTON CITY, Dec. 12, 1850.

Our mechanics and scientific men in this section are still looking out for Mr. Paine with his wonderful machine for obtaining light and heat from water. It was announced that he was coming on with all his apparatus to demonstrate the facts. He has written a long letter to the "Union," in answer to objections to his alleged extraordinary invention, but if he wishes to convince the public that he has actually made the discovery, the best way for him to accomplish his purpose is to produce the invention. Certainly, public exhibition and demonstration would put an end to the dispute.

The members of Congress from Michigan have received copies of a resolution passed by the Legislature of the State, instructing them to use their influence in the passage of an act granting to the heirs of Moore and Hascall a renewal of the patent for their harvesting machine for the further term of 14 years from the 28th of June, 1850. It is set forth that the importance of the invention has induced the patentees to make many and great improvements, whereby the abilities of the machine have been much increased, so that they are now enabled to harvest, thresh, clean, and deposite in the sack, from the grain standing in the field, from 20 to 25 acres of grain per day, which could not have been done by the machine as originally invented.

Owing to the large number of private claims which have been standing for 20 years, there can be no reasonable hope that Congress will attend to applications for the renewal of patents. If the patentees of the harvesting machine succeed in getting a renewal on the ground of improvements, there will be hundreds of similar applications.

I understand that the Patent Committee will report a resolution offering a suitable remuneration to any scientific person who shall discover the means of rendering the Capitol and Patent Office Buildings impervious to moisture.

As soon as the excitement in Congress shall have subsided, so that members can attend to other matters, I hear that an experiment for the purpose of showing the strength of Remington's Bridge will be made on a large scale. By an experiment recently made in Alabama, three pieces of yellow pine, one inch square, formed into a bridge, bore a weight of 2900 pounds. It appears a rather tough story, but "seeing will be believing."

An ingenious artist here, after a long trial, thinks he has succeeded in obtaining portraits in oil by the photographic process equal to any in London, about which so much has been said.

In your official list of patents of last week, you speak of the re-issue of a patent to R. S. Stewart, assignee of Moses Chase, deceased. Now this Mr. Chase is in the land of the living, and may be seen at his house in Baltimore. It is curious how the Patent Office obtained the news of his death.

The wooden sleepers for railroads are about to be used in this section as being much cheaper than that of stone. A saving of fifty per cent. can be made. I see that during three years, the expenses of the Providence and Worcester Railroads together, embracing 166 miles of track, with wooden sleepers, were more than $11,000 less than those of the Lowell road of 53 miles of track, with stone sleepers.

At the new finishing shop, at our Navy Yard, there is a vertical upright boring machine, capable of boring a cylinder of ten or twelve feet in diameter, and also arranged for chucking and turning, by the use of a horizontal self-acting slide rest, 16 feet long. Also a planing machine capable of planing 9 feet wide, 8 feet high, and 22 feet long.

Some of the papers here are lauding an alledged newly discovered oil, by a Dr. Marshall, of Pa., which, it is said, possesses peculiar and valuable properties, as a single ounce will go further in oiling machinery than a quart of common oil. I may be mistaken, but I think this discovery is not very recent. It is wonderful, however, how far a little "editorial oil" will sometimes go.

The Equestrian Statue of Gen. Jackson, composed of the brass cannon taken by him at New Orleans, is nearly completed. It will be placed in Lafayette Square. *

Dr. Dick and the Christian Citizen.

Three weeks ago we published an article about Dr. Dick, the Christian Philosopher. In that it was stated, from an extract taken from the "Christian Citizen," subscribed with Dr. Dick's name, that he had never received any money from any of the American publishers of his works, with the exception of some trifling sums from Messrs. Harper & Brothers, of this city. Elihu Burritt has published quite a long article on the subject of the old philosopher's poverty, and we have no doubt but he is in penury, as we have already stated. Basing our remarks upon the authority of Mr. Burritt, and the article in his paper, we hinted to our publishers, that they should do the honorable thing in the matter. In reply to our call for contributions, we have been informed by Mr. Pratt, of the firm of Pratt, Woodruff & Co. large publishers, of this city, that the firm of Robinson & Pratt, publishers at Hartford, Ct., negotiated through Eli Burrit, the brother of the learned blacksmith, with Dr. Dick, and paid him $500 for his work "Mental Illumination," and $300 for his work on "Covetousness." It is our desire to publish truth only. We do not know how to reconcile the article in the Christian Citizen with these statements. It is very evident that there is "something wrong," and the matter should be set right before the public. In this one case, we have a fact stated, that Mr. Burritt received for Dr. Dick's work, second hand, as large a sum as was paid him by English publishers. Whatever credit belongs to the American publishers, should be given fairly and above board.

The London Literary Gazette states that "Dr. Dick is now 72 years of age, and is in a state of obscure poverty, with heavy claims upon resources scarcely adequate to his own wants." Whatever opinions may be expressed respecting the money Dr. Dick has received for his works, or the way of helping him, there surely can be no question about giving it for a good purpose, when it is to relieve such a worthy man.

Iconographic Encyclopedia of Science, Literature and Art.

The fourth part of this great and good work, published by Rudolph Garrigue, Barclay street, this city, is now issued. The plates are truly pictures of Natural History in all departments. As this is a work from the German, we must state, that no people have done so much in this department as the German, and their patience, habits of investigation, and deep thinking are admirably displayed in this work.

Accoustics is treated in this No., (especially that part which relates to music) in a way peculiar to a people so highly distinguished for musical attainments. We will have time to give some extracts from this work, at a future period, but at present we must say and say it sincerely, that the plates alone are worth the price. $1 per No.

"The Scientific American now comes to us in a most beautiful dress. Every artist and mechanic, as well as every student of science, should subscribe for it, and carefully preserve it on file. It is in quarto form, adapted for binding.—[Bath Advertiser.

We hope the editor of the advertiser is on the *Swift* road "to fortune and to fame."—This paper, by the way, is an excellent independent daily, and has the elements of success in it, "dealing in facts and principles and not to a depraved taste for exagerated fiction or low ribaldry.

California Gold.

Independent of amounts brought by passengers, there have been $3,800,000 California gold received since the month of last June. The last news from San Francisco states that provisious were very high, and a great deal of disease raging, such as scurvy, but that great quantities of gold were yet found on all the important rivers.

Inversion of Babies.

The most outrageous and infamous of all the wild practices of which nurses are guilty, and of which nursery maids avail themselves to get rid of nursing or attending to their young charges for a short time, is that of holding children by their feet their heads pendant to the earth, and swinging them to and fro! This is the common practice of Irish nurses and servants. (I hope that I may not be charged with slander.) I vouch for the fact; not a child of my own—and I have six—having ever escaped this treatment, notwithstanding every watchfulness. I know it to have occured in numerous families.—When reprimanded for such conduct, the reply of the nurse always is—"Sure we do it in Ireland to put the children to slap" (sleep.) How many cases of hydrocephalus, marasmus and nervous diseases are thus superinduced, it is imposible even to surmise.—[Medical Journal.

[Some may entertain doubts regarding the correctness of the above, but we can endorse its truthfulness, with the exception of two words "common practice." We know however that it is practiced.

Prof. Barry's Tricopherous.

Among the many tonics that are sold for beautifying humanity there is none that we can so highly recommend as the use of Prof. Barry's celebrated Tricopherous for the hair. The change produced in a persons hair by the use of this Tricopherous is truly astonishing. The most perverse locks on the most uncultivated heads are rendered comely soft and easy to manage by the use of this celebrated tonic. The nature of this preparation is such that by applying it to a person's head the hair becomes soft and the head free from dandruff without the use of filthy oils which many use to the destruction of the most ornamental part of their person (the hair].

Prof. Barry's office is 137 Broadway where all orders are promptly filled. Price single bottle 25 cts. The the usual discount to the trade.

Supernatural Knocking.

A "Knocking at the Door," at nights which has alarmed the good people of Rochester, who attributed it to spiritual agency, is explained in the American Journal of Science by Professor Loomis, as the effect of the vibration of a dam over which water fails. Professor Loomis describes this vibrating as producing sounds like a loud knocking on the doors and walls of buildings, and gives a particular account of the phenomena, as observed at the dams of Cuyahoga Falls, Ohio; East Windsor, Conn.; Springfield Mass; Northampton, Mass.; Gardiner, Maine, and Hartford, Conn. He attributes the vibrations to the friction of the running water which falls over the dam, and shows how these sounds are transmitted to a distance by the earth, and produce that sudden and alarming knocking sound in dwellings. Professor Loomis has pointed out very simple and easy methods of checking this vibratory action in the dams, and the people of Rochester who have been troubled by an invisible spirit will find it easily exorcised by mechanical means.

New Theory of Cholera.

Mrs. Willard has published a pamphlet about Cholera wherein are stated a few things which are well worthy of attention. It states that what is termed *colapse* is want of respiration. The lungs being unable to act with sufficient vigor, are filled with carbonic acid and nitrogen, and can receive no oxygen from the atmosphere; and the blood, no longer oxygenated, no longer imparts vitality, becomes dead, its fibrin and serum separating. The first curative step is to discharge, the bad air from the lungs, and replace it with that fit for respiration. For this purpose she advises that the patient be placed in the open air, with the face against the wind, and to be supported in an erect posture, and then by suddenly stooping, and pressing the hand upon the lower part of the chest, to respire forcible, and then suddenly rising, and raising the arms from the sides, to inspire as forcibly as possible. She mentions cases in which this gave immediate relief.

Mercantile Library Association,

We are glad to perceive that the Mercantile Library Association have made further arrangements for useful lectures during the winter. The first and second of the series will be delivered on Tuesday evenings, Jan. 22 and 29, by Ralph W. Emerson; subjects—"England," and "London." They will be continued on the following Tuesday evenings, by R. H. Dana; subject—"Woman." E. P. Whipple, subject—"Character." Rev. Wm. Ware; subject—"Florence;" and Rev. Dr. Bethune, subject—"Holland and the Hollanders."

The well known character of the above named gentlemen is a sufficient guarantee that the lectures will be highly instructive and interesting. Our young men will do well to secure tickets for the course at an early day, or they will miss an intellectual treat of the rarest kind.

Down of the Eider Duck.

The down of the Eider Duck is one of the most singular and curious products of nature; it is beautiful and soft, and is the best non-conductor that is known. It is so firm and elastic that a quantity which can be pressed between the two hands, will form a garment which is little more than the weight of a few feathers, but which retains more heat than a blanket. The resort of these birds is the wild cold regions of the North. The God of Heaven has provided its down for the benefit of the inhabitants of those regions.

Plank Roads.

This kind of road is now an important feature of American enterprise. There are nearly 1000 miles of in this State, and the progress of them is onward. Utica and Oswego plank road unites the Valley of the Mohawk with Lakes Oneida and Ontario, and opens up a most interesting district of country to the advantages of convenient commercial transit. We look upon plank roads in America as a new and important feature for social and commercial benefit to our people.

The U. S. Dry Dock at Brooklyn.

This great work is completed, and last week the sloop-of-war "Dale," was docked in it. It is one of the greatest works in the world. It was planned and all the greatest difficulties (and great they were) overcome by Mr. McAlpine, C. E. It was finished by Mr. C. B. Stewart, C. E., recently appointed. Mr. McAlpine earned for himself a great and deserved fame by this work.

Half a Century.

There has been quite a controversy in some papers, about whether 1850 was the beginning of this half century, or not, many supposing that 1849 completed the first half. To talk much about these things on paper, is a waste of good ink and good sense. The man who believes that time commenced with the year 0, must be a cyphering genius, and the only way to treat him is to let him revolve round in his own circle.

Books.

We have made arrangements with Mr. Griffiths, the author of the work upon Naval Architecture, noticed in our last week's number, to supply all who may wish, the work as it is issued. The price is 75 cents per number—can be sent by mail to any part of the country. We would also state, in addition, that whenever our readers wish any of the works noticed by us from time to time, we will always supply them at the prices given.

Water-p oof Blacking.

Geo. R. Townsley, of Springfield, Mass., has invented a new article of blacking, which renders boots entirely impervious to water, and is also susceptible of a fine polish. It is the best article of water-proof blacking we have ever used, and we would recommend it to the public.

John B. Patch has recovered of the Vermont and Massachusetts Railroad $2500 for damages received in 1847, by the breaking down of a bridge at Athol, over Miller's River.

The trial of a number more of Astor Theatre rioters, has commenced and one has been sentenced to State Prison.

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Scientific Memoranda.

VEGETABLE FLESH.

A writer in the Westminster Review on human progress gives utterance to the following curious speculations,

"The practice of feeding on the flesh of animals, entombing their bodies within our own, has something in it repugnant to refinement. Many individuals there are who wholly abstain from this food, and confine themselves to vegetables. Some there are who abstain even to the injury of their own health. We are not counsellors of this species of martyrdom but nevertheless think it desirable that the practice of eating animals should disappear from civilized communities so soon as other means of maintaining their physicial energies can be obtained. We think that nature has provided for this also, as another phase of man's existence, when his brain shall be set to work upon it. We will endeavor to analyze the subject.

Grass and plants are organized bodies, endowed with life and feeding on earths and minerals; in short, aggregating together various chemical ingredients. Some of these plants we eat directly, others we eat indirectly, by feeding animals on them, and then feeding on the animals. All this is simply an indirect course of gathering together chemical ingredients in our own bodies. The problem, then, to solve is, how shall we accomplish the task of gathering the chemical ingredients together, and applying them to our bodies—from inorganic, and not organic matter?

In examining the qualities of vegetables, we find that some are oily, some sugary, some glutinous—as the olive, the sugar-cane, and many plants and trees yielding gum. There is yet another variety, seeming to constitute the midway mixture of the animal and vegetable—the mushroom. These vegetables seem to point out to us our course. Could we produce a new vegetable, or cross some old vegetable so as to unite the three qualities of wheat, olives, and sugar-cane, we should have attained a species of vegetable flesh, no doubt of highly nutritious quality."

There is an anecdote of a certain Methodist Missionary, who destroyed the whole ancient religion of a celebrated Brahmin, by making him look through a microscope on a cut pomgranate. Man in every age and in every country has been and ever will be a feeder on animal and vegetable food.

CALIFORNIA GOLD REGION.

This region extends from the western base to the summit of the range of the Sierra Nevada, a distance generally of a hundred miles, or more. The western slope is broken and through the deep ravines that abound, flow the numerous mountain streams that form the tributaries of the Sacremento and San Joaquin rivers. The gold region is a longitudinal strip or tract from ten to forty miles in width lying about midway, or a little lower, between the base and summit of the range, and extending in length a distance of many hundred miles—active operations being already carried through an extent of four or five miles at least.

The gold region is always associated with quartz, and is not found in the slate as is generally supposed, except as covered and imbedded in some convulsion. By the latest news companies are forming to pulverize and extract the gold from the quartz, one dollars worth of gold, it is said, can be extracted from one pound of gold quartz.

JAPAN.

The Japanese are said to have acquired the art of smelting copper to extract the silver from some Hindoos, in the year 1591. There is more evidence to prove that the East Indies was the cradle of the Arts than that Egypt was.

Water for Albany.

Mr. R. Pruyn has presented a petition from the Corporation of Albany, to supply that city with pure and wholesome water. We hope that the citizens of Albany will act as if they were in earnest about this most important matter. It is a city whose inhabitants are often panting for water, with one of the most splendid rivers in the world laving its base—"there must be something wrong."

Short Biography of Sir M. J. Brunel.

This great inventor, whose death we recently announced deserves more than a mere passing notice. In the London Times of the 13th Dec. 1849, we find a short skectch of his life and from a few other extracts previously collected we here present a brief but not a less interesting Memoir. He was born in Hacqueville, Normandy, in 1769 and was therefore a Frenchman. He was educated for the church, with the prospect of succeeding to a living, and was accordingly sent at an early age to the seminary of St. Nicain, at Rouen. But he soon evinced so strong a predilection for the physicial sciences, and so great a genius, for mathematics, that the superiors of the establishment recommended he should be educated for some other profession than that of the church. His farther strongly objected to his adopting the profession of an engineer, and he therefore determined that he should be educated for the naval service, in which he thought his son's proficiency in mathematics might lay the foundation of his advancement in that profession. At the proper age he entered the Royal Navy. On one occasion he surprised his captain by producing a sextant and quadrant of his own construction, and which he used for making observations. He made several voyages to the West Indies, and returned home in 1792. At this time the French revolution was at his height. As Mr. Brunel entertained royalist opinions, which he was not very careful to suppress, he was forced to seek safety in flight. He emigrated to the United States, where necessity, fortunately, compelled him to follow the natural bent of his mind and to adopt the profession of a civil engineer He was first engaged to survey a large tract of land near Lake Erie. He was employed in building the Bowery Theatre, in New York, which not many years ago, was burnt down, he furnished plans for canals, aud for various machines connected with a cannon foundry then being established in the State of New York.

In 1799 he went to England and offered his services and plans for ship blocks to the British government. Lord Spencer, then we believe first lord of the Admirality, became his friend and patron. He became a frequent guest at Spencer House, and never failed to speak warmly of the assistance and encouragement he derived from the friendship of Lord and Lady Spencer. From this time he continued to riside in England, and refused to entertain many propositions made to him to leave England and settle abroad under the auspices of other governments. After much opposition to his plans—for every powerful interest was arrayed against him, not lessened in that day by his being a Frenchman—he was employed to execute them in Portsmouth dock-yard. To perfect his designs and to erect the machinery was the arduous labor of many years.

He selected Mr. H. Mandsley to be his assistant, who was then a poor man, and brought him into deserved notice, and laid the foundation of his wealth and great engineering establishment in the city of London.

The block machinery was finished in 1806, and has continued ever since in full operation supplying the fleet with blocks of a very superior description to those previously in use, and at a large annual saving to the public. It was estimated at the time that the saving, in the first year, amounted to $120,000 per annum: and about two thirds of that sum were awarded to Mr. Brunel. Even after the elapse of forty years, notwithstanding the marvellously rapid strides made in the improvement and construction of machines of all kinds, it remains as effective as it was when first erected, and unaltered.

A few years afterwards he was employed by government to erect saw-mills, upon a new principle, in the dock-yards of Chatham and Woolwich. Several other inventions were the offspring of his singularly fertile mind about this time,—the circular saw for cutting veneers of valuable woods; and the beautiful little machine for winding cotton thread into balls, which greatly extended its consumption. About two years before the determination of the war, Mr. Brunel, under the countenance of the Duke of York, invented a machine for making shoes for the army by machinery, the value and cheapness of which were fully appreciated, and they were extensively used; but, the peace of 1815 lessening the demand, the machinery was ultimately laid aside. Steam navigation also at that time attracted his attention. He was engaged in the building of one of he first Ramsgate steamboats, and, we believe, introduced the principle of the double engine for the purpose. He also induced the Admiralty to allow him to build a vessel to try the experiment of towing ships out to sea, the possibility of which was then denied.—Many other objects of great public utility occupied his mind, which in this mere outline of a long and active life must be excluded, some of which were failures such as propelling boats by carbonic gas, but this has been the case with every inventor.

He proposed to the Emperor Alexander of Russia a plan for making a tunnel under the Neva, where the accumulation of ice, and the suddenness with which it breaks up on the termination of winter, rendered the erection of a bridge a work of great difficulty. This was the origin of his plan for a tunnel under the Thames, which had been twice before attempted without success. In 1824, however a company was formed, and supported by the Duke of Wellington, who took, from first to last, a deep interest in the work. Many men of science also joined it, amongst whom Dr. Wollaston was the most prominent, and whose brother long continued one of the most active and able promoters of the scheme. The work was commenced in 1824. It was stopped more than once during its progress by the breaking in of the river, and more effectually at last by the exhausted finances of the company, which never extended beyond the command of £180,000. At length, after the suspension of the work for many years, by a special act of parliament, a loan was sanctioned, the Exchequer Loan Commissioners advanced the funds necessary for the completion of the work under the river, and, notwithstanding many weighty professional opinions were advanced against the practicability of the work, from both the loose alluvial nature of the soil through which it had to be constructed, and the superincumbent flood of water, it was finished and opened to the public in 1843. In a scientific point of view, this work will always be regarded as displaying the highest professional ability, an amount of energy and perseverence rarely exceeded and a fertility of invention and resources under what were deemed insurmountable difficulties, which will always secure to Sir I. Brunel a high place amongst the engineers of every country. During Lord Melbourne's administration, Mr. Brunel received the honor of knighthood, on the recommendation of the late Lord Spencer, then Lord Althrop. Sir I. Brunel was a vice president of the Royal Society, a corresponding member of the Institute of France, and a vice president of the Institution of Civil Engineers. He was also a chevalier of the Legion of Honor. He was unaffected, simple in his habits, and benevolent and as ready to a kind act as he was to forget an injury. He died in his 81st year after a long illness, which first visited him soon after the completion of the Tunnel, a brief sketch of which we will present next week.

Spain and its Resources.

The more I have contemplated this magnificent country, this extraordinary climate, superabundant soil, and bold and sturdy peasantry, the more I am at a loss to understand the causes that make all these gifts of Providence of no avail, and why such a nation should be plunged in a seemingly interminable civil war, devastating the cities, the fields and the provinces. An acute Spaniard observed to me, "If we had but six honest men, and they the ministers, we should have peace, order and tranquility; but there are no such persons to be found." Again he remarked—"The climate which you so much eulogise is one cause of our wretchedness; every article of life is so cheap that a Spaniard can live on three half-pence a day, and would rather idle all his time away than undertake any labor," and this is probably much of the cause of Spanish deterioration; where the earth produces easily as in warm climates, the people are unaccustomed to work and activity, and to the valuable habits resulting from steady exertion; so they sink satisfied under a despotic government, because it saves them the trouble of thinking and acting for themselves, having no institutions to cherish a different spirit among them. The old system, too, of Spain, when each province had its own peculiar laws, customs and privileges, was a bar to free internal communication throughout the country, and roads, and bridges, and public works and enterprise were, and are almost entirely wanting.

There was no national opinion for education was at a low ebb; corruption existed ted in and tainted every thing from the highest minister to the humblest of his officials; the public departments and the law courts were filled with favoritism, servility, and venality; services and the rights were disregarded in favor of the highest bidder. This was the complaint of the Spanish themselves. The mines of Spain have been no less neglected than the above ground produce. There are said to be coal-mines of a good quality in Asturias, but no one cares to lay out capital in working them. The quick-silver mines of Armaden, &c., are the property of the government; they pay no taxes, and produce about one quarter of a million sterling; these constitute one-sixth of the whole, and the revenue from the remainder does not exceed £50,000 annually. The same number of beasts of draught and burden are said to be employed in these mines, and half a million of men.—Were they properly looked after which becomes the more important since the loss of America to Spain—the increase, it is generally considered, would be enormous, and the results highly beneficial to the government and country at large, in the vast impulse thus given to national activity. As it is, the south of Spain is far superior to the north in developement of resources and the merchants of Cadiz have certainly set the example to their countrymen.—[Marquis of Londonderry's Tour.

Marine Discoveries in Charleston Harbor,

The Charleston Mercury, thus speaks of some important facts by the Coast Survey in that harbor:

Rumor has been busy for some days past with reported discoveries in our harbor, and as much misapprehension and exaggeration has obtained currency respecting them, we will briefly state what we have reason to believe are the facts of the case. Lieut. Maffit, of the Coast Survey, in prosecuting his labors in our harbor, has made such discoveries as to induce the opinion that what is known as the Swash Channel, and heretofore used only for the smallest class vessels, affords as great a depth of water as the main Ship Channel, whilst its facilities for ingress are vastly superior. But this discovery derives additional importance from the fact that the bottom of the channel, in its shallowest parts, is composed of hard marl and shells, showing that the current has already swept away the lighter and softer materials, and affording a well grounded hope that, by a little assistance in dredging, any depth of water may be obtained. If further investigations, which will be diligently pursued, shall realize these anticipations, the importance of this discovery to the commercial interests of our city can hardly be over estimated.

Culture of Tea.

The French have introduced, it is said, with flattering prospects of success, the culture of tea into France, and have also attempted to introduce it into Algiers. In the wide space occupied by the kingdom of France, and by its possessions in Africa, the experimenters will have a sufficient range for the choice of the soil and climate which shall be found best adapted to the culture. The experiment thus far, it is said, has been most successful in France, and that the climate of Algiers has proved to hot. We are pleased to observe also that the subject is attracting the attention of our own people. So far we think the results have proved satisfactory, and we hope more attention will be paid to it. We have good tea growing latitudes.

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New Inventions.

Candles made by Railway Process.

The Baltimore American states that Messrs. Mattewson, candle manufactures of that city, have introduced a new English patent machine for making candles, which is both ingenious and possess uncommon merit in an economical point of view.

It consists of a number of moulds, holding 18 each, which are furnished with a bobbin to each mould, holding wick for over 100 candles on each bobbin.

At the commencement the first mould is threaded by hand. It is then placed on a railroad and brought under a cistern from which it is filled with tallow ; it is then shoved along to a carriage, which, when it has received its load, is conveyed by rail outside to an open shed in the yard, where it is allowed to cool. When that operation is completed it still continues its circuit on the railroad, until it arrives at the machine, upon which it is placed and a stroke of a lever ejects the whole 18 candles, at the same time threading the moulds for a fresh charge ; a revolving saw knife cuts off the wicks as quick as the hand can move it across the machine, the ends of the wicks are seized by pincers. which grip each of them as a person would with the finger and thumb ; it is again placed on the rail and continues its course to undergo the same operation. On their way over the rail they are interrupted by a person who removes the pincers and trims the butt ends of the candle.

New Single Blade Propeller.

We learn by the Ledger, that a Mr. Bond has been exhibiting at the Rotunda of the Exchange, Philadelphia, a new propeller, which, by the use of two cylinders, a motion similar to that of the blade of an oar in sculling is given to the propeller. The principle has been tested with this model, which was propelled at the rate of over four miles an hour, and also with a boat 22 feet in length, which was driven by a single engine of 2½ horse power at the rate of nine miles an hour, and towed a large line canal boat, which was fifty times its tonnage. The same boat made the run from the city to Burlington in three hours and a quarter, with a consumption of only two bushels of coal.

Not such a great affair after all.

Labor-saving Churns.

C. E. Clark, of Dansville, N. Y., represents that he has made some valuable improvements in labor-saving Churns. He employs three or more rounds in each beater, and applies a beater for the purpose of bringing the cream to a proper temperature without the use of either warm or cold water, as the case may be. The dash is so constructed as to have one beater down all the time, rendering the agitation equal, steady and perfect. Each beater produces a vertical as well as a rotary motion, and is all done in a most simple and economical manner.

Perpetual Motion Again.

The Maine Farmer and Gazette states that Mr. S. B. Walton, of Livermore Falls, in that State, has at last invented perpetual motion, that it can move a clock, and "has been in operation, *unless stopped by some foreign agent*, for a year or more."

There are three perpetual motions at present in the field, one in Georgia, one in Pennsylvania and one in Maine. When will men be wise :—no machine can give out more power than it receives.

Ice Machine.

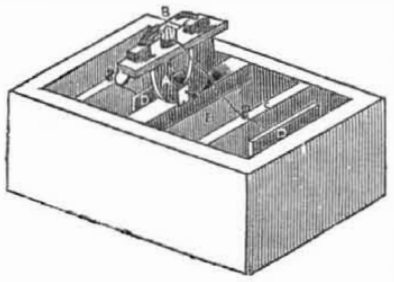
We have received a few lines from one of our valued Southern correspondents, who states that Mr. Wilcox, of New Orleans, has completed his improvements on his ice machine, and by it he will be able to produce ice in large cubes in our warmer climates, at a cost not much exceeding $3 per ton.

New Shaving Cream.

We see it stated that Mr. Isaac Babbitt, the Boston inventor of the Babbitt anti-friction metal boxes, has invented a new cream shaving soap, that can whip off the bristles almost without a razor.

New Method of Electrotyping.

This is a plan to copy devices on metal, whereby drawings or letters, in relief, are obtained to print like wood cuts or metal types. Take a smooth plate of copper, cover it with a thin coating of composition made with one part (by weight) of white wax, two parts of lard, and one of lampblack: grind them with a little olive oil, and then melt it and pour it over the copper plate, which must lie perfectly level. When this mixture is cold, engrave the design on its surface, so that the bright copper is visible along all the lines only. The usual tools may be employed. When this is done, it may be brushed over for rough engravings, with black lead as a conducting material, but for delicate engravings, this will not answer. The best way then, is to plunge the plate into a weak solution of the nitrate of silver, and then expose it for a short time to the vapor of an alcoholic solution of phosphorus. The back and the sides of the plate must then be well varnished, and it is then to be electrotyped.

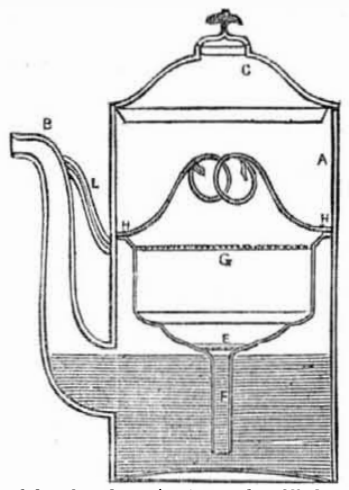


The apparatus for this purpose is very simple :—A square wooden box is procured, with a partition in it of porous wood, but perfectly water-tight. There will then be two cells, over each of which fix horizontally a small bar of iron, and from one hang the copper plate perpendicular into the cell by a varnished copper wire soldered to the centre of its back ; and in a similar manner hang a zinc plate from the other bar, which should be about the same size as the copper bar, but no varnish on it or the wire. The above cut represents an apparatus of this kind, with a rotating magnet on it, which continually breaks and renews the contact between the two plates, and causes the deposition to go on more regular. For small engravings the magnet is not necessary, but for large plates, where time is an object, and delicate lines of not so much advantage, then the magnet may be used, but for fine lines it should not be used.

A is the steel magnet ; B is its armature made of soft iron, and enveloped in a coil of fine insulated copper wire. It is suspended on a fine pivot, which proceeds from the centre of the cup on the shelf, which is around the poles of the magnet ; the magnet itself being supported vertically by the screw on a stout piece of wood over the partition. E. C C are the iron bars, each with a binding screw on its centre, from which proceed the connecting wires, from the plates, D, first, to the mercury in the small cup, F. This cup is divided by a partition, the height of which is regulated that the terminations of the coil which dip into the mercury may pass over without touching, while the mercury from the repulsion which subsists between it and the wood, is divided into two masses, each of which, in the middle, is higher than the partition. When connection is made between the plates, by placing each of the wires in a separate cell of the cup, observing that each of the perpendicular wires of the coil is also in a separate cell, the armature will revolve regularly renewing and breaking contact with the two plates, the rapidity of which depends on the quantity of electricity flowing through the wires. Into the cell containing the copper plate, pour a solution of the sulphate of copper till the plate is covered, and into the other pour water, slightly acidulated with sulphuric acid. If a metalic connection be made between the two iron bars, simply by connecting the two wires from the set screws, an electric action will take place, passing along to the copper plate, depositing pure copper into the engraved lines. The operation should be allowed to proceed for about a fortnight, when the deposited copper will have attained sufficient thickness to be separated from the engraving. It must then be fixed on a block of wood to be the proper height for printing. The cells must occasionally be supplied with materials, as the process goes on, to replenish that which is decomposed. The sulphate of copper must not be allowed to become weak, or the copper deposited will be disintegrated. The plate must be often examined. If the copper is deposited too fast, the copper will be too brittle, and when too slow it will also be brittle. A little experience alone gives correct knowledge to know these things, but it is an experience very easy to acquire.

Improved Method of Making Coffee Extracts.

This is a vertical section showing the interior. It consists of an external vessel, A, which is somewhat similiar to the ordinary coffee-pot, and like that article is furnished with a close lid, C, for the purpose of retaining the heat, and a spout, B, for withdrawing the preparation. The interior of the vessel, A, has another vessel, D, either permanently attached thereto or else fitted to it in an airtight manner ; in the bottom of this inner chamber, a fine strainer, E, is placed and below that it terminates in a small pipe, F, which depends therefrom, reaching nearly to the bottom of the outer vessel, A ; the upper part of the inner vessel, D, is furnished with a strainer, G, but which is of a coarser description than that placed at the bottom ; the strainer is furnished with a handle for removing it from its positon it being fitted into a conical seat, and secured by turning the lugs of the strainer, G, below projections, H, on the interior of the vessel, A. In using this apparatus, the lower



part of the chamber, A, is to be filled with boiling water, to the extent represented in the cut, which is about level with the lower strainer ; this should be the extreme limit, as any further supply would interfere with the perfect performance of the apparatus ; the coffee or other matter from which the infusion is to be extracted is placed in the chamber on the surface of the strainer, E, and the strainer, G, is secured in its place, as before described ; a cork is applied to stop up the spout, and the cover, C, is also placed in its seat, when the apparatus is placed on a slow clear fire, or over a lamp but the slower the operation is allowed to proceed the better, as the object is not so much to boil the water again, but for causing tho air contained in the lower part of the chamber, A, above the liquid, to expand, which has the effect of forcing the water slowly up the tube, F, through the coffee, and the strainers, E, and G, into the upper part of the apparatus ; this process will continue until the water is as low in the bottom chamber as the end of the pipe, F, when it will cease ; this will be ascertained by the forming of blubbers on the surface. The apparatus is then removed from the fire, or the lamp extinguished, as the case may be, and by the cooling of the air in the lower chamber, a partial vacuum will be produced, causing the extract to pass through the strainers into the lower chamber, when it will be fit for use. The cork may now be removed, when the infusion can be poured out as usual, and in order to facility which the lower chamber has a small tube, L, connecting it with the spout near the orifice ; by this means air is admitted above the surface of the infusion, otherwise air would not find ready egress to the vessel, rendering the process both inconvenient and tedious : this air tube is carried into the spout in order that the insertion of a cork in the orifice thereof, may stop all external communication with the lower part of the vessel, so as to carry out the invention with as little trouble as possible. The water, instead of being poured boiling into the apparatus, may be introduced in a cold state, and allowed to boil in the vessel itself ; but care must be taken that the coffee should not be placed in the chamber, until the water reaches the boiling point for to subject the coffee to heat for any length of time before the infusion takes place, destroys part of the delicate aroma which it is so essential to preserve.

For the Scientific American.

Action and Re-Action.

Concluded from page 132.)

The following is the tabuletted experiments referred to in the article with the above caption, on page 131 of our last number, and should be read in connection with it.

No. of Expr.	Product of W. & Dist.	Dist. moved.	of Cars.	Weight	Dist. moved.	Product of W. & Dist.	Sum of Prod.
1st	137	13.7	10	10	13.7	137	274
2d	109	7.3	15	10	16.5	165	274
3d	106	5.3	20	10	18.1	181	287
4th	84	2.8	30	10	19.3	193	277
5th	—	—	Fixed.	10	27.5	275	275
6th	—	—	Fixed.	20	14	280	280

It may be observed that the force of the springs is applied equally to both cars in exp. 1st ; that they are each moved 13.7 inches, which multiplied by the weight, gives 13.7× 10=137, and this doubled for the two cars, gives 274, as shown in the last column, for the whole force of the spring when equally divided between the two. The experiments No. 2, 3 and 4 give nearly the same results when the force is unequally divided. And exp. 5th gives 175 for the force when it is applied entirely to one car.

The variations from the same amount as carried out in the last column may be owing to some imperfection in my apparatus, or some variation in friction or probably both.

Silas Cornell.

American Inventions.

Mr. Ewbank has recently addressed to the governor of each of the States and Territories, a circular in which he earnestly calls the attention of these officers to his desire to trace up the history of American inventions, and to obtain possession of any facts that may lie hidden in the records of patents known to have been granted, under colonial rule, and other patents granted by more or less of the States previous to their conceding the right to the general government. He remarks that the application of machinery to many branches of art was begun almost solely by the labor and ingenuity of our countrymen, and yet definite information respecting these inventions while in their infancy, is entirely wanting. It is necessary that the patent office should possess information on these points ; but irrespective of the light this information would throw on the origin of the inventions to which they relate, an interest will attach to it as a matter of enlightened curiosity.

He makes a request of the governors, that in case no official documents relating to these inventions are on file, they would refer the subject to any literary or scientific society, or to private individuals who may be in possession of the information sought. All societies, therefore and all individuals, that may be able to place any such information in the hands of the Commissioner, will receive his and the department's thanks.

All information of this kind must be authentic, not hearsay, to be valuable. We trust that the act of the Commissioner, will meet with a hearty response in every state. The departments of Secretaries of State and the old libraries are the places where such information will be picked up.

Sugar Crop.

We learn from the New Orleans Picayune, that the sugar crop of Louisiana for the year 1849 will turn out better, perhaps, than was expected some time ago, and may not be much behind that of 1848. But there does not seem to be much uniformity in the crop, it being much better in some districts than in others.

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Scientific American

NEW YORK, JANUARY 19, 1850.

What was to be; What is, and What is not.

It is the fortune, or misfortune, of every age, we cannot tell which, to be the witness of great events that never transpire. On the twenty-third day of April, 1843, this world was certain to come to an end, according to the views of some visionaries, but we congratulate our fellow-men that our globe stood the test of that earthquake of excitement, and she is still walking round on her path of beauty, fresh as the day when she commenced her celestial course, when all "the morning stars sang together for joy." It seems, almost always, to follow as a counterbalance to the real, that we should frequently be beguiled by the fallacious. In the field of invention and discovery, we behold the same ups and downs that so often astonish, delude, and gratify, in other departments of things that belong to life. The great Boyle was always on the point of discovering perpetual motion, and since his day the world has been often astonished with such kind of machines, but they are as if they were not. A few years ago, a plan was got up to convey packages to any distance through air-tight tubes, exhausted by air pumps. This discovery was to revolutionize the carrying express trade—but it is no more. This is a plan, which no one can jeer at, for if it would operate, its advantages would be immense.

In the line of navigating the ærial ocean, above us, how many triumphant lucky inventors, have arisen, some to delude themselves, and some to delude others. Were it possible to accomplish the object with security and economy, no one would doubt its importance, nor would there be a single dispute about its advantages and benefits; but at the present moment, we must say that there is "no hope."

During the past two years, in London especially, and from there to the ends of the world, nothing was heard of from time to time, but the great "Electric Light." A Frenchman discovered one kind, an Englishman another, and a Scotchman another, all—all, were to make short work of gas companies with their bagatelle of retorts, pipes, fume and expenses. At one time the price of stocks fell considerably, and there was no little panic in the gas market. It has turned out after all, that the electric was the lighter gas, and the old kind still maintains its gravity and position, while the jeers of its younger opponents have been converted into an expiring moan for its lost consequence. Thus it is that we are ever on the rounds of the ladder—now up and now down, but for all that, there is a steady advancement to the top of the building. The most shrewd and discerning are often deceived, with the plausibility of some inventions, and neither genius nor acquirements, keep people from committing blunders. Newton made a blunder in his theory of seven distinct colors—Franklin was in error in explaining the theory of electricity—Davy made many mistakes, and so did Watt. We need not think that we have arrived at perfection in this age, or that we have not our failings as well as those who have lived before us. We look forward in one sense "to see the same scenes which our fathers have seen, and to tell the same tales which our fathers have told." The wisdom which we can gather from the past, is that of experience—to avoid the errors we have seen others commit, and forget not the good which we have seen accomplished. But there are some who only look on the dark background of the picture and see no beauty in the contrast of light and shade. Some are continually ridiculing new inventions. The steam engine, the steamboat, and many other good inventions, had then supreme judges of wiseacres, who wagged their heads in portentous dignity at the folly and credulity of man. When Fulton's steamboat stopped for a short time, owing to some defect in her machinery, there can be no doubt, but many shook their heads and said "just as we said—all folly." While this is true respecting one class of men, we are sorry to say, there are many evidently worthless projects often brought before the public, wilfully to delude. The deluders find it very easy to take refuge behind the names and shadows of departed worth, and many throw out hints of their martyrdom, to false public opinion.—It is very difficult to give advice respecting new inventions, so far as it relates to a perfectly new application. All that can be done, is the exercise of the judgment coupled with sound knowledge of the subject. In giving advice, or expressing an opinion, we always are sincere, and we have ever found that truth and sincerity are never far separated. No one should despise a thing because it is new or opposed to preconceived notions, and no one should be two ready to jump at conclusions, however plausible they may appear, without a full and careful examination of the subject in all its bearings.

Properties of the Crank.

[Concluded from page 125.]

Few intelligent engineers are aware of the wide-spread and unlearned opinions respecting the properties of the crank. There is scarcely a week passes over our heads without some contrivance being presented to us, either in the shape of a rotary engine, or some device "to save," as the inventors say, "the power lost by the crank." We have often been deeply grieved at the time and money spent by some on such contrivances, and have always endeavored to turn inventive minds in the right direction. There are many ingenious men who cannot be turned from their settled opinions, and from the abstract philosophy of the principle of the crank, it is easier to produce an argument against than for it, to the unscientific. This is the reason why so many controversies have arisen about its qualities, and such controversies may be expected again.—The opponents of the crank, never state the question correctly, and this is the case with the author of the articles to which we referred in our last. He says that the crank has stood in the way of improvements on the steam engine for fifty years. This is doing great injustice to many ingenious men that we might name, both at home and abroad, who have done much to improve the steam engine. But let us state one authenticated fact. In 1798, the best of Watt's Cornwall engines did a duty of 40,000,000; that is, one bushel of coals raised that amount one foot high. In 1840 the Cornwall engines did a duty of 84,000,000. This was a duty of more than double that done by an engine which Watt thought was perfect.

Those who speak against the crank, say that there is more than one half of the power of the engine lost by it. They have formed their ideas from wrong views of its operation and combination. They say, "the crank is a rigid inflexible lever, firmly fixed and secured to the main shaft, operated upon, through the intervention of an equally rigid and inflexible connecting rod, which at one end is attached to the piston, rod, the latter of which has a rectilineal and reciprocating motion."

Now this is not true, for by the above description, the crank would not move at all, for the very reason that those mechanical contrivances which connect the crank to the rods, are not stated. These are joints which enable the connecting levers to work beautifully on centre pins. In the language of M. Arago, there is a certain articulated parallelogram, and at each ascent and descent of the piston, its angles open and close with sweetness: I had almost said, with the grace which charms you see in the gestures of a consummate actor. Follow with your eye alternately the progress of its successive changes, and you will find them subject to the most curious geometrical conditions. You will see that of the four angles of the *jointed* parallelograms, three describe circular arches, but the fourth, which moves the piston rod, moves nearly in a straight line. The immense *utility* of this result strikes mechanics with less force than the means by which Watt attained it."

If mechanics could see the utility of this, they would not wrangle against it, but it is because they do not look upon the *modus operandi* of the engine, that so many of them pursue an *ignus fatus*, in search of substitutes. Nay, the articles to which we refer, bring a railing accusation against the advocates of the crank, and say, when they give the sequent of the power and effect, to prove that no power is lost, "oh, that is a mere description of the *modus operandi*." It is for want of looking at the steam engine in a dynamical light, that many make so grave mistakes about it. Some of them treat it, like the author in question, as if it were to be judged in its nature, like the combination of levers in the construction of a bridge, as if it were altogether a question of statistics. They say that a crank four feet long has a leverage of less than two feet, and the way they prove it is this, "There are two points in the crank circle where there is admitted to be no leverage, and there are two points in the crank circle where it has full leverage, therefore as the half of 4 is 2, and the crank 4 feet, the average leverage must be 2." So far so good, but by the same system of reasoning, we could prove that all the power together would be absorbed in the crank. For example, "There are two negative and two positive points in the crank circle, then as the negative balances the positive, all power exerted by the positive is nullified by the negative This is as good reasoning as the anti-crankites use. If we do not take the *modus operandi* of the steam engine into consideration, we have no business to go round the circle described by the crank at all. It is positively necessary that every proposition should be right, or the working of it will not be correct. It is well known how bitter the dispute was between the British and German philosophers in the 17th century, about the forces of moving bodies; Newton and Leibnitz—the greatest philosophers of that day, disputed about a thing in which they were both right, but stated the question differently: so it is with many about leverage. What is a lever? Nothing at all but a piece of wood or iron, apart from its *modus operandi*. The shepherd's crook becomes a lever when he uses it for a spring pole to vault over the roaring torrent, but afterwards it is his simple crook still. A crank without taking the operation of the engine into consideration, is but a crook of iron, and at best is but a peculiar handle on the main shaft. It has been proposed to apply a pulley as a substitute for a crank. In two instances this was attempted years ago, as described in the Engineer's Journal. As might be expected they were poor substitutes. In turning an axle by hand, that is to convert reciprecating into circular motion in a natural way, we never think of applying the power by a rope to the periphery of the shaft. No, we put a crank on it; and when we use a wheel we put the handle on it inside of its rim, and make it a crank. Does any person suppose that there is a loss of power here? Not one. If we wanted to change a rotary motion into a reciprocating one, such as to use a water wheel, to pump a mine, would any person of common observation, suppose that power was lost by putting a crank on the wheel shaft, and attaching it to the pump rod, by a connecting rod? Not one. This is the most simple and best way to do it.

Mr. J. Frost, of Brooklyn, has constructed a neat machine to demonstrate by practical experiment that no power is lost by the crank. It consists of three pulleys, the middle one fixed on a concentric spindle, and the other two placed eccentrically opposite one another on spindles attached to the middle one. On the periphery of the middle one, at one side, is suspended, by a cord, a weight of two pounds, and on the peripheries of the eccentric pulleys, by cords; on the one side opposite the weight of the middle pulley, is a pound weight on each; now it makes no matter how much the pulleys may be revolved, in whatever position the eccentric pulley (crank) may be to the concentric one, the two single pound weights, independent of position, balance the two pound weight.

Mr. E. Chaffee, of New Brunswick, in a letter, solves the problem in favor of the crank, in as simple, but in a different manner, and we have a letter from an *Engineer* in Brooklyn, (we wish we could publish it, and would only we have had so many articles lately on abstract subjects) which, viewing the steam engine in a dynamical light, the true way, leaves not a grain of sand for the opponents of the crank to stand on. His letter is mathematically sure and demonstrative. We have another letter from Mr. C. Grinnel, of Marion, Ala., which we will publish next week, and thus end this controversy, for a long time at least. In it he compares the crank and rod to the human arm, and this is the light in which we view it, and we must not talk of it as a combination of rigid levers. The operation of the crank is not to be viewed like the impact of balls upon a billiard table. It is very erroneous to suppose that oblique action, independent of friction, destroys power in a machine. If this were true, we might, if there were no friction, make a machine generate power—a thing impossible.

The average leverage of a crank four feet long, is 30 6-11 inches, with an excess of velocity over the piston of 17 5-11 inches, which makes 4 feet, thus harmonizing all the equivalents. By the law of virtual velocities, one pound moving through a space of 10 inches, will lift a weight of 10 pounds through a space of one inch, therefore in estimating the value of power in the crank, we must take the power and velocity into our calculations. A crank of 4 feet is the radius of a circle of 25 1-7 feet and during the time the piston moves 16 feet, the crank moves through a space of 25 1-7 feet, more than one-third greater velocity.—Now, instead of having an excess of velocity, the anti-crankites should have transfixed it at the dead power points. The formula for finding the average leverage of the crank, is to take the proportional parts of the space moved over by the piston, and its excess during one revolution out of the crank; therefore 4 feet piston moved 16 feet, excess of motion 9 1-7 feet, 16 feet is 112-7, and 9 1-7 is 64-7, crank is 48 inches, therefore divide 48 inches into two parts, proportioned to 112-7 and 64-7, and we have 30 6-11 for the 16 feet and 17 5-11 for the 9 1-7 feet, thus harmonizing the velocity and power in a most simple manner, without the flaw of a fraction; and we have beautiful collateral proof of the correctness of this formula, for if we calculate the circle described by a crank of 30 6-11 inches, it will be found to be 16 feet exactly—"the centre of power." The excess of velocity in the crank over the piston, is so happy a contrivance to regulate motion, that we cannot compare it to anything better than a compensation pendulum. If we take a cylinder 8 feet long, and try to make it describe a circle with a full stroke up and down, we will make it describe 25 1-7 feet, the same as the crank. To do this, transfix it with a pin and make it perform one revolution, and what have we but the circle of the crank. With the velocity of the crank, we cannot have the full leverage, for if that were the case, we would gain more than one-third of the power every revolution, but in the way we have examined it, all harmonizes according to the laws of Mechanical Science.

The writer in the Tribune to which we referred, makes the loss by the crank, 62 per cent. This shows us how very far abstract fallacy leads people from direct truth, for in Wales, where the power of the engines, are registered by Dynometers, they give out 90 per cent., and no difference is perceived between the crank engines and those which have no crank. Could these engines give out that power, if there was a loss by the crank? No. It has always puzzled us to find out the pocket or hamper, where the crank stowed away the power communicated to it, by the theory of the pulleyites. It must be a curious place.

We know of no mechanical contrivance so mathematically beautiful in every respect, to convert the reciprocatory motion of the piston into circular motion, as the simple crank. Its invention was a divine thought. The geometrical engineer can detect its properties at a glance, and this was the reason why the great Watt laid aside his beautiful Sun and Planet motion, for something more beautiful still—the "Incomparable Crank."

Notice.

Subscribers writing us for Patent Claims must give the dates of the same, as we cannot afford the time to look our list all through. We cannot pay attention to such letters unless this request is attended to so far as possible.

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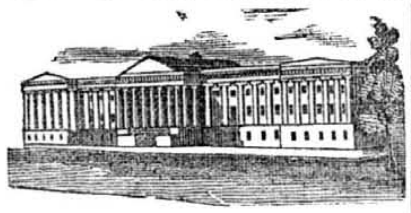

LIST OF PATENTS CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

For the week ending January 8, 1850.

To John Bell, of Harlem, in the City and County of New York, N. Y., for improvement in Printer's Type cases.

I confine my claim to grooving the bottoms of type cases for the reception of the lower edges of the partitions and securing these in them by glue, in the manner herein seth forth and of modes substantially the same.

To James Black, of Philadelphia, Pa., for improvements in Engines operated by Steam and Water.

I claim the manner of combining steam and air for the purpose of giving motive power to the wheel, consisting in a jet of the former being thrown from the nozzle of the pipe into the pipe, simultaneously introducing therein a quantity of the latter, which together are discharged through the lower orifice of said pipe, into the buckets of the wheel, and displacing the water therein, causing said wheel to revolve, in combination with the pipe through which the hot air is drawn from the top of the box or reservoir into the pipe and re-introduced with the steam into the box at its bottom, thus using it repeatedly over again. The apparatus, by means of which the above is accomplished, is constructed and arranged substantially in the manner described in the foregoing specification.

To William Bullock, of Philadelphia, Pa., for improvement in Grain Drills. Ante-dated Oct. 29, 1849.

I claim, first, the rollers which serve to clear the teeth from rubbish and govern the depth of the teeth.

Second, the spring in combination with the sheaves and teeth by which arrangement the whole or a part of the teeth can be held by a spring of the same power and range of movement that it would require for a single tooth.

Third, the moveable bar to which the team is attached, in combination with the mode of hanging the teeth by means of sheaves or other similar device, by which arrangement the teeth will pass over obstructions in which the action of the team in hauling the Drill or Cultivator will bring the teeth forward to their proper places as soon as they pass over the obstructions.

And fourth, the feeding band, substantially in the manner and for the purpose set forth.

To Ashley Crafts and Ebenezer Weeks, of Auburn, Ohio, for improvement in Cultivators.

We do not claim to be the original inventors of any of the individual parts of this wheeled rotary cylindrical Cultivator, but what we do claim is the combination of the levers, roller and driving wheel, in the manner and for the purpose set forth.

To John Du Bois, of Greensboro', Ala, for improvement in Cotton Gins.

I claim the back ribs in combination with the front ribs, they (the ribs) being constructed with a horn or projection on each, behind which they curve downwards, to allow the saws to pass twice between the ribs, to remove the motes and other impurities, in the manner substantially as described.—[See Engraving in No. 51, Vol. 4.]

To G. W. Eddy, of Waterford, N. Y., for improvement in Car Wheels.

I claim the combination of the rods which connect the hub and rim with the plate or plates are protected against fracture from any sudden jar, and the hub prevented from being separated from the rim should the plate or plates break, as herein described.

To J. G. Goshon, of Shirleysburg, Pa., for improvement in Smut Machines.

What I claim is constructing the shoe [having the perforated plate for separating large extraneous matter from the grain] with a screw for separating the cockle and cheat from the grain, and an imperforated plate and spout for conducting the same to the outside of the machine as described.

To Thos. Hoyt, of New York, N. Y., for improvement in Curing Tobacco stems.

What I claim is the process of curing stem or other parts of tobacco with charcoal by combining or mixing the two together, substantially in the manner and for the purpose herein set forth.

To W. M. Hughes, of Howard Co., Mo., for improved Ore Washer.

What I claim is separating substances differing in specific gravity or washing metallic ores by means of oblique currents of water and a horizontal one passing over the same in a reverse direction, substantially in the manner herein described. The oblique currents being produced by inclined surfaces or their equivalents.

To Wm. Maguire, of Cincinnati, Ohio, for method of counterbalancing Sash by means of a heavy weight.

What I claim is counterbalancing the sash, (and consequently enabling it to be suspended at any desired point) by means of metallic racks within the window frame, these racks being operated by pinions rotating on fixed shafts within the window frame and these pinions being driven by other racks attached to the sides of the sashes throughout their entire length, the whole being constructed and arranged in the manner and for the purpose set forth.

To L. W. Miller, of Mesopotamia, Ohio, for improvement in connecting cutters to shafts of boring instruments.

What I claim is the fastening, by which the knives are affixed to the mandrel, being a keyed ring to sustain the shank of the knives firmly, in adjusting slots in the mandrel, substantially as above described.

To E. G. Pomeroy, of St. Louis, Mo., for improvement in coating iron with copper or its alloy.

What I claim, is, first, the before described process of coating and impregnating iron in all useful shapes and forms with copper or any alloy of which copper forms a part, the said process consisting of cleansing with sulphuric acid, defending the cleansed surface with a coating of clay or other aluminous earth—drying the same, and then plunging the article thus coated into a melted copper, or some alloy of that metal.

Second, I also claim the use of the clay paste to protect the metal from oxidating during the process of alloying or coating the metal plates, or pieces of iron, as herein set forth.

To Z. C. Robbins, of St. Louis, Mo., for improvement in Churns.

What we claim is the placing the inner surfaces of the series of outer blades, in positions tangential, or nearly so, to their circle of rotation, when they are combined with the inclined inner series of blades, substantially in the manner and for the purpose as herein set forth. Not intending, however, to limit myself to the exact number, proportions, positions, and arrangement of the dasher blades, as herein described and represented, but shall vary them to suit the different sizes of churns required for operating upon cream, whilst I attain the same results by means substantially the same as those herein particularly set forth.

To F. Slaughter & D. Perry, of Fredericksburgh, Va., for improvement in machinery for making Cotton Cordage.

What we claim is the constructing the nipper springs of parallel bars, (one or both of which may be made elastic,) having series of holes (or slots) formed in them for the reception of the connecting and adjusting screw bolts, for the purpose of enabling us to cause the several nippers to press with the same amount of power and elasticity upon the slivers during their passage through the nipper heads; and also to vary the elasticity of the springs as circumstances may require, substantially as herein set forth.

To James Spratt, of Cincinnati, Ohio, for improvement in alloys for points of lightning rods.

What I claim is the formation of an alloy, compesed of English block tin, oxide of tin, antimony, bismuth, refined silver, platinum, and silex. In proportions as shown in the specifications, and for the purpose of being manufactured into lightning rod points.

To A. Welch and R. Walker, of Bennington, Ind., for improvement in Machinery for Dressing Shingles.

What we claim is the combination of two planes guided and moved to and fro in the straight converging grooves with the spring-plates in front of the plane-irons for holding the slab, and those behind the plane-irons for discharging the finished shingle from the machine, the whole being arranged and operating as herein set forth.

To Wm. Wood, of Westport, Conn., for improvement in machines for cutting shingles.

What I claim is the mode of moving the carriage sideways, and forcing the same toward the knife, alternately, by means of the cams moving over the grooved shaft, by means of the bar and groove operating on the curved bars, cams, inclined bars, and bolts, arranged in the tubes, and pressed against the notches of the slotted bars by the spiral and other springs, the whole arranged and operated substantially in the manner and for the purpose herein set forth.

To O. Wright, of Rochester, N. Y., for improvement in Mills for sawing irregular forms.

I claim the mode of raising and lowering the table or platform on the segmental plates or bars for adapting the same to any thickness of timber to be cut, and keeping the middle of the timber, between its top and bottom, always in a line with the centre of which the segmental plates or bars form arcs of circles, through which (the centre) the saw passes, to prevent it from bending in the timber when sawing a curvilinear surface, by means of the ribs having slots near their ends, through which the screws which enter the segmental plates or bars, pass in the manner herein described.—[See Engraving in No. 3, Vol. 5, Sci. Am.]

DESIGNS.

To H. L. Shepherd, of Dayton, Ohio, for Design for Stoves.

RENEWAL.

To A. Morse, Jr., of Boston, Mass., for improvement in Capstans. Patented March 12, 1846.

The invention here claimed is the improvement of the ships or vessels' capstans, so that increased power may be obtained at pleasure as above made known, with the arrangement, application and adaptation of the several parts as described.

Singular Electrical Phenomenon.

Messrs. Editors—In the fore part of the month of December last my attention was called by my wife to a piece of brown new silk folded up in a bureau drawer. On approaching it with a lighted candle, it being night, I observed it shining and sparkling with minute particles or atoms of various colors, some golden hue, others green, and some the colors of brilliant stars. When a hand was gently rubbed or drawn over its surface these sparkles vanished with a crepitating noise, and when another fold was opened the same phenomenon occurred. I wondered at the time whether these could be electrical atoms, but knowing that silk was a good retainer of electricity, and its fibres being brilliant, I was inclined to an opinion that the sparkling atoms were silk fibres.

On the 8th of the present month my attention was again called to this same piece of silk, which had been deposited in the same place. This time, it was in he day time, between 11 and 12 o'clock. I ordered it to be brought down stairs into my room, as gently as possible. Here I laid it in the light of a window, and I observed the shining atoms vanishing from its surface—much like the disappearance of fine dew drops. I raised another fold of the silk and passed my hand close to its surface, when the particles discharged with crepitating reports in the character of a *feu de joie*. As the folds were opened, these particles would vanish without the proximity of conducting substances, and peculiarly fast in the light. It appears to me that what I have only heretofore known to exist, I have now seen to exist. And I believe these particles were electrical matter. What think you of it, gentlemen? John Wise.

Lancaster, Pa., Jan. 10, 1950.

N. B.—The other silk about the house did not exhibit the same phenomenon.

[These particles were, without doubt, electrical sparks. There are some colors more electrical than others; although we cannot say that they conttain more electricity, but in certain conditions give it out. Thus, if red or yellow silk is dried at a temperature of 300°, and taken immediately out of an apartment of that heat, long sparks of electricity will be given out by drawing the hand over it. We have often seen this phenomenon. Cotton yarn impregnated with alum, and dried at 300° Fahr., exhibits the same phenomenon. When either the silk or cotton becomes cold, the electrical phenomenon disappears. Brown silk is prepared with alum as a basis for the color, and both yellow and red dye are employed in the coloring of it. We have never seen a notice of the facts we state in any work on electricity, nor do we know if philosophers generally are aware of the same.—[Eds.

Great Meeting of Gas Consumers.—Proff. Grant's Light.

A very large meeting of gas consumers, was held in this city on last Wednesday, and a committee appointed to draft resolutions requesting the Legislature to investigate the affairs of the Gas Cos. of the city. It seems that while these Companies furnish light to the inhabitants, their affairs are kept greatly in the dark.

Professor Grant explained a plan by which the City could be lighted at a five thousandth part of the expense now incurred. The light is of his own discovery, and the principal ingredient is nitrate of soda, which can be had in inexhaustible quantities in South America. the residum of the soda after being used, would be more valuable than the article in its crude state. One of those lights placed in Broadway corner of Canal-st. on the top of a house, would enable a person to read throughout the whole of that street and neighborhood. He has one of them in use on the locomotive "Rough and Ready," on the Philadelphia Railroad line. By it the engineer can see three-quarters of a mile ahead, and is enabled to observe the switch-pole for half a mile.—The expense of that light for four nights was only 25 cents.

A committee of three were appointed to examine this new discovery and report upon it.

The Importance of Conversation.

Daniel Webster said in the course of a speech at Dedham, Massachusetts, before the Norfolk County Agricultural Society, that "Every man obtained a great part of whatever knowledge he might possess by conversation and communication with others. Books indeed might do something in this respect, but nothing in comparison with free communication. If we should deduct from the aggregate of each man's knowledge, whatever he had learned by communication and conversation with his fellow-man, very little would be left and that little not worth much at best. It was intercourse with each other that made men sharp, and active, and enterprising."

Daniel Webster is right in his estimate of the value of conversation, but were there no books to read there would be very little conversation worth listening to, in our estimate of things. Books are the things that furnish texts for conversation, and we never knew any man whose conversation was very gifted, who was not a reader; every one knows this to be true.

British India.

It contains 100,000,000 of people: is provided with an army of 300,000 men, who support costs $70,000,000 per annum, the whole public revenue of India being only twice $70,000,000. There are thousands of military officers brought from Europe, whose appointments are a source of patronage in the hands of influential men. In 1846, the public debt of India (apart from that of England) was $187,000,000, the annual interest on which was nearly $9,000,000.

The Ocean Steam Navigation Company.

The proprietors of the New York, Southampton and Bremen line of steamships, have decided to resume the monthly communication between this city and Bremen, on the 20th proximo, instead of waiting until March as before announced. The Washington will sail first, and the Hermann on the succeeding month.

A piece of Lead Ore, weighing 1,500 pounds' was recently received at New Orleans from Arkansas. The ore is said to yield 120 ounces of silver to the ton.

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TO CORRESPONDENTS.

"M. R., of Maine."—Wait till our history of propellers is published, and you will see that your plan is not entirely new. $2 received.

"W. F., of Boston."—The air chamber of the Rifle, as you remark, allowed more time for the complete ignition of the powder, but also for the purpose stated, as the priming in the bottom of the cartridge answers the very purpose of the globe you speak of, it being converted in to a gas, very expansive, and the great heat of it rarifies the air in the chamber to perform the office stated. The reason of the cannon ball rising after leaving the gun, is not owing to the cause you state. The reason is, that the range of vision must be elevated according to the distance from the mark, although the cannon and mark, may be on the same level; stand by thesea shore and try the experiment.

"J. A. R., of Pa."—Do not know of a reliable work upon the subject referred to in your communication of the 5th inst.

"N. F. E., of Vt."—We have not been able to learn whether the "Pegging Machines" work well or not. We think Mr. J. Robinson of Lawrence, Mass., has a patent for one.

"A. G., of Ind."—We do not see how such a claim could have been granted, as the principle appears common, and in extensive use. Upon due consideration we are of the opinion that you cannot obtain a patent for the grate and inclined board, as it appears to be the substitution of one common device for another. It we misunderstand your views you had bettor forward a drawing described by letters of reference. We do not countenance any attempts to infringe a patentee's just rights.

"J. S. P., of Geo."—Your request must have been overlooked. If you have any information to ask, you are at liberty to do so. No. 2 sent; $1 received and credited.

"J. F. B., of Louisville."—We are informed by the publisher of "Chapman's Drawing Book," that Part 4 will not be issued until late in the Spring. We have given you credit for $1, and will send it as soon as issued. The Camera was shipped on the 11th inst., by Express,—and your name entered for one year's subscription.

"A. S., of N. Y."—We are so much hurried with business that we cannot undertake your case. You had better accept of the claim suggested by the Patent Office, it will save you much trouble, and we think it sufficiently strong.

"C. S. H., of Pa."—We shall retain your bridle bits until your order—do not know any thing against the A. U., at present, but you may rest assured that if we discover foul play they will hear from us. No. 48 sent.

"J. B. W., of N. C."—We do not think your plan for preventing boiler explosions to be new. By reference to Lyman's Safety Guage you will find that he employs glass tubes in which the mercury rises. It would make no difference whether the tubes were made to convey water or mercury. In this case they are employed for the same purpose.

"E. M., of Ind."—You *can* obtain a patent just as soon by staying at home, and it would save you much expense. By sending a drawing and full description, we can advise you in regard to its novelty $2 received.

"A. P. K., of R. I."—Neither the top nor botton can be said to move one point faster than the other, the whole circumferance moves in unison.

"E. V., of Geo."—Minifies Drawing Book was forwarded on the 12th inst. The sliding scale is worth $2.

"F. S. T., of N. H."—All that you need do now in order to make a fortune out of your invention, is to get the machine before the public. An engraving in the Sci. Am., would reach 25,000 at least, half of whom the invention would particularly interest. An engraving we will prepare and publish for the paltry sum of $8, and we will warrant it to bring you 50 persons at least, who will willingly pay you a reasonable sum for all the the teritory you have to dispose of.

"G. Vt., of N. Y."—It would be a long job to give you a full description of the various wind mills in use. Should be glad to do so but cannot spare the time.

"H. M., of N. Y."—By reference to the last number of the Sci. Am., you will perceive that Mr. Jones was answered, in regard to his churn. You ask information and charge us for the trouble of giving it—this is not fair by any means. Our correspondents are requested to pay postage on all communications addressed to this office, or no attention can be paid to them.

"Curiosity."—According to Dr. Dick, the ancient Greeks and Romans were ignorant of many articles in diet which we now hold in much esteem. They used no alcoholic liquor, nor coffee, tea, chocolate, sugar, or even butter, many of the tropical spices were also unknown to them. They were fond of the flesh of wild asses, puppies, mice, foxes, bears, and lizards, using asafœtida and rue, for seasoning. It is not fashionable to chew, but to eschew such articles at the present day.

"W. H. L., of Miss."—Such a fair as you refer to is to be held in London next year—but the minutia of arrangements have not yet been concluded. We shall notice it in due time. You cannot obtain the last half of vol. 4, in sheets. $3 received and credited.

"J. E. B., of N. C."—We have handed your letter to several saw makers, and they seem not to comprehend its meaning. Youhad better address, R. Hoe & Co., of this city, giving the full particulars.

"A. J., of N. Y."—A machine has been invented in England, to register the speed of railway trains. It operates by means of an eccentric, geared to the axis of the cars. Your plan may be very different from this.

"W. C. S., of N. Y."—To render your paper hangings washable, give the paper two or three coats of size, and then, varnish it over with good spirit varnish, and you can wash it with soap suds without injuring the colors in the least.

"J. D., of Vt."—Your subscription expires with No. 26 Vol. 6 or March 11 1851.

O. W. S., of Conn., A. L., of Me., T. J. of Mass., and H. S. T., of Mass.—

The specifications and drawings of your several inventions have been forwarded to the Patent Office since our last issue.

Money received on account of Patent Office business, since Jan. 7, 1850:—

O. W. S., of Conn., $20; A. L., of Me., $20; T. & Co., of N. Y., $50; S. H. S., of O., $30; A. O., of N. Y., $30; C. N. S., of Va., $47; and W. F. P., of Mass., $30.

Cultivation of the Castor Bean in Ohio.

A company of manufactures have recently put up a castor oil mill in Cincinnati, Ohio, and in order to encourage the grewth of the castor bean in that State, propose to furnish all farmers wishing to cultivate them with seed, and contract with them for all they raise, at the market price. The present price is $2 a bushel. The bean is planted and cultivated the same as Indian corn, and will produce from 30 to 50 bushels an acre. The market is now supplied to a considerable extent from Illinois.

Arctic Bears.

Sir James Ross narrates seme remarkable incidents connected with his recent voyage to the Arctic regions. A bear walked into Captain Ross's party, and surveyed them with cool inquisitiveness; guns were levelled, and the bear was wounded in the head; he scratched his ear, and walked off with an air of superior contempt. Another bear was seen to slide on his haunches down a cliff of seven hundred feet high, steadying himself with his fore paws most "judgmatically," as the sailors said.

The Parkman murder in Boston is a singular affair, and bears about it some mysterious connection, for one day a paragraph appears in one paper, to throw suspicions on the accused and then on the next day, there is sure to be a paragraph of the opposite tendency, in another paper.

Notice.

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

ADVERTISEMENTS.

GENERAL AGENTS,
FOR THE SCIENTIFIC AMERICAN.

New York City,	Geo. Dexter & Bro.
Boston,	Messrs. Hotchkiss & Co.
Philadelphia,	Stokes & Brother.
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Jackson, Miss.	R. Morris & Co.
Southern,	W. H. Weld & Co.

LOCAL AGENTS.

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For the Scientific American.

On Tanning Leather.—Preparation of Hides.

(Continued from page 136.)

Having treated of the manufacture of sole leather, we have just this warning to give in regard to it, viz., that at the expense of good leather, tanners may save time by using too strong liquors and too hot at first. In warm weather, the liquors are very liable to get sour, thick and slippery, like molasses. This injures the hides. We are sorry to say that we do not know of any cheap chemical remedy that would not be injurious on the other hand.—The only true way to avoid injury is great attention, and a frequent change of liquor to keep them fresh. Weaker liquors should be used and more of them given, than in cold weather and small pits are more economical than in large ones, that is, for working them. No man can be a good tanner unless he is very attentive, observing and industrious, but with these qualities, and they are high ones, any man can be a good tanner.

Tanneries that are erected far in the timber districts of our country, to get a plentiful and cheap supply of hemlock bark, soon find a cheap supply cut off, by it getting scarce. But no man need be afraid of doing a nice snug business at tanning, if he has a few acres of land by the method we propose now to instruct him in.

It is well known that sumac grows plentifully in every part of our country, but there is one kind named the "Sicily Sumac," that is of a most excellent quality. The stems, leaves, &c., of this shrub, are ground up and employed like oak bark, only it is far better to boil the sumac, cool it, and use the clear liquor.

Bramble—There is another astringent shrub which grows freely and abundantly in every part of our country, and which to our knowledge, has never been employed here, but which makes far better leather, especially for uppers, than any other substance known. That shrub is the common Bramble or Blackberry. It makes leather more soft and pliable than oak bark; the leather being of that softness and pliability peculiar to what is termed "French Leather."

The blackberry stalks are broken in small pieces, ground, and steeped in water, and have very astringent qualities. The shrub or blackberry bushes should be cut in the spring, when they are full of sap, and they are employed in every way like oak bark, and there is no difference except in the quality of the leather produced—the bramble made leather being much improved, is softer and wears longer. The leather is also tanned sooner, the astringent of the blackberry having a greater affinity for the hides than the oak bark has. While blackberries can be grown in our country, we need have no fears of a want of materials for tanning. The discovery of blackberries for this purpose is due to Mr. R. Patterson, of England, who took out a patent for the same about fourteen years ago, but from some bad arrangement with some wealthy capitalists, he never received any benefit from it, and after making leather for about a year, he was even prevented by them from using his own discovery. A short time since application was made to the Lords of the Privy Council, for an extension of it. Its real merits and the superior quality of the leather made by it, were established by full and unequivocal testimony of practical tanners, and those who had used the leather. The extension of the patent was denied—much to the regret of the Privy Council. They all expressed themselves favorable to the patentee, and were convinced of the utility of the discovery, but by a strict construction of usage and law they could not advise an extension of the patent. The discovery of blackberries as a substitute for oak bark was held to be so valuable, that parties were easily found to procure patents in all the European kingdoms, but the discovery is now the property of the world. So far as we know, this is the first time, a knowledge of this discovery has been brought before the American public, and as our country has capacities and every facility for tanning by this method, we believe that we are doing "the State some service" in disseminating this information.

History of Propellers and Steam Navigation.

[Continued from page 136.]

The first steamboat that was built on the Mississippi was named the "Enterprise," and was about 70 tons burden; she was built with a single wheel placed in her stern, and in 1815 took 28 days to go from New Orleans to Cincinnati. Considering the state of the river at that period, this was not a bad voyage. In 1789 Symington navigated canals with only one paddle wheel in the stern, but in 1822 Gordon made an improvement, by placing the wheel in the stern as here represented.

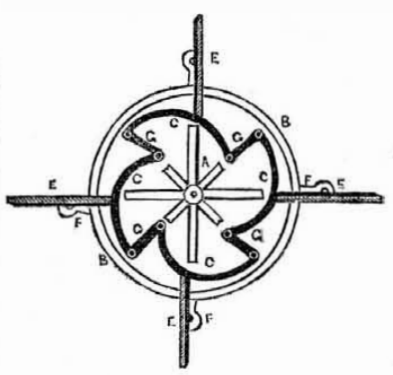
Fig. 13.

This is a longitudinal section of the boat, intended to be driven by steam, but no apparatus of that kind shown. It has a channel made through its whole length at the bottom, being open at its under side (like an inverted trough) until it comes to the place where the paddle wheel case commences, and there the channel is closed up under the paddles, nearly to touch their extremities as they revolve. She was to be steered by two rudders, one on each side of the paddle wheel, connected together by jointed rods so as to be moved by one tiller. A is the wheel, and C is the entrance for the water coming along the channel spoken of, which then freely escapes behind. The entrance aperture may be furnished with a gate to admit just as much or as little water as is desired, and with a grate in it to prevent sticks, &c., from injuring the paddles. For canals this invention is one of no inconsiderable merit.

Fig. 14.

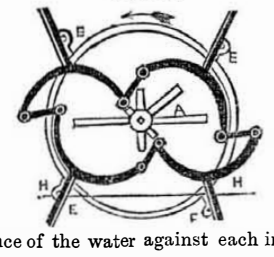
About this period it was also proposed to employ reciprocating paddles as substitute for the paddle wheel, to enter and leave the water vertically, as herein represented. A A are the cranks which are moved by the engine, and turns with them the horizontal bar to which the vertical paddles are fixed. It is very evident that these paddles cannot be moved fast enough to afford the slightest shadow of a hope in competing with a paddle wheel, back lift of water and all.

Fig. 15.



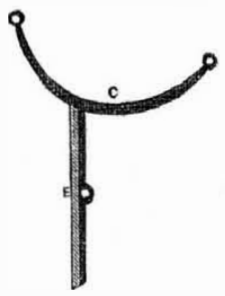
This is another plan that was invented by a Mr. Hill, of Woolwich, Eng., to make the paddles enter and leave the water vertically, and to pass through the water eliptically, a hobby indulged in by a great many since that time. This plan, however, is very ingenious, as will be observed by the accompanying description of the separate figures of side views, the same letters referring to like parts:—A A A represent the spokes of the paddle-wheel, shown as disconnected and broken off from the periphery, B B, to prevent its being confused with the novel propelling part; C C C C are four bent levers, one of which is shown separately by fig. 17; E E E E represent the edges of the paddle boards, which are bolted to the straight arms of the levers, C, and are connected by axles to four short arms, F F F F, which radiate from the periphery of the wheel; each end of the curved part of the levers is attached to the next lever in the series, by an intermediate short rod, G G G G. Owing to this mode of connecting the short rods by pivot joints, the

Fig. 16.



resistance of the water against each immersed paddle, causes the next in succession which is entering the water, to be depressed at its extremity, thereby throwing it into that position or that angle with the surface of the water, by which it meets with the least impediment to its immersion. The resistance of the water upon the paddle that has preceded it, then draws the other into the vertical position, at the same time that it is itself being raised out of the water, at a similar angle to that by

Fig. 17.



which it entered; these motions are communicated successively to all the paddles by the revolution of the wheel.

Curious Scientific Discovery.

It has long been known, and any one may test the fact, that when a drop of water is placed upon a piece of iron, red or white hot and the hotter the better, instead of being instantly converted into vapor, it draws itself up into a globular shape, and is not even boiled by the intense heat. It occurred to a French philosopher, that this fact might explain certain phenomena, of men being able to handle or walk upon intensely hot substances, and upon making the experiment, he found that he could put his hands in melted iron, or walk over it barefoot with ease, any person can do this when the skin is moist, the only caution necessary being not to move the hand or other part in contract with the incandescent metal too quickly. The experiment must be done deliberately, with the iron or other metal at a white heat, or if melted still better. This fact accounts very simply for some astonishing miracles which it has hitherto required no little faith to believe.

[The above we copy from an exchange and we would say to any one who might be desirous of trying the experiment, just to treat it as Garrick treated his doctor's prescriptions, "throw it out of the window.

Rotary Steamboat Explosion.

On the 10th inst., at Philadelphia, the boiler of a small steamboat, named the Invincible, exploded, as is said, owing to a defect in the boiler. The boat was shivered to pieces, and all on board precipitated among the cakes of ice in the river; all were more or less hurt, but there were only a few hands on board.—The party were taken off from the ice by a boat from shore, or all would have perished. The engine of the boat was a rotary, the invention of Dr. Baldwin, and the steam, after passing through it, was condensed by means of pipes that traversed the whole length of the boat, and returning to the boiler so as to avoid any escape of steam. The propeller was also entirely original in its construction, and patented. It was geared with a strap so as to make over a thousand turns per minute. The boat was launched in August last, from the canal, near Beach and Maiden streets. She was 75 feet long, and built on the model of the little propeller May. The boiler was an upright one, filled with tubes, through which the heat passed from the furnace, which was of uncommonly small dimensions.

The Boston Transcript states that there are several establishments in Cambridgeport, Mass. at each of which 300,000 lbs. of family soap are manufactured annually.

Telegraphing.

One of the operators in the Eastern Telegraph office in New York, succeeded in writing direct to Halifax (N. S.) a distance of between 900 and 1000 miles.

LITERARY NOTICES.

Stone, Iron, and Wooden Bridges. By George Duggan, C. E.—Part 1 of a new work on the above subject, comprising viaducts, tunnels, culverts, ect., of the U. S. Railroads, has just been issued. It is illustrated by a series of drawings from actual measurement of the works—including plans, sections and elevations of each structure. It contains judicious remarks on all the different forms of construction embracing strength, beauty, durability, economy, etc., and it will contain an appendix on the art as practised in Europe. It will be published monthly, and completed in about 12 parts, at 75 cents each, and can be furnished at the office of the Scientific American. It is principally designed for the members of the engineering profession, and should, by them, receive the fullest encouragement, as it requires a large circulation, to make such a work pay the bare expenses.—Part 1 contains working drawings of the Railroad Bridge at Willimansett, Conn., also of a bridge 88 feet span, on the Utica and Syracuse Railroads.

Dramatic Works of William Shakspeare.—Published by Phillips, Sampson & Co., Boston —These enterprizing publishers have already issued seven numbers of this splendid work, each of which comprizes one play, and a beautifully executed engraving of the leading female character. The seventh number contains a fine portrait of Shakspeare from a painting in possession of the Duke of Buckingham, and also his biography. Within a few years the writings of this great man have taken their proper place among the literary works of this country, and no person living, whatever his station, can fail of reaping a rich reward, by a careful study of Shakspeare's writings. No library is complete without them, and we advise our friends to secure these numbers without delay, as they are published for the low sum of 25 cents each. Can be had of Dewitt & Davenport, H. Long & Bro., and of booksellers generally.

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Literary Sketches and Letters of Charles Lamb. By Thomas Noon Talfourd. Published and for sale by Appleton & Co., 200 Broadway.

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